Proc. Nutr. Soc. Aust. (1992) 17

BONE DENSITY, CALCIUM INTAKE AND ACTIVITY IN FEMALE TWINS

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Bone density (BD) has a genetic basis but is also affected by environmental factors. The aim of this study was to assess the effect of dietary calcium and activity on BD in female twins: adolescents 11-17 years, young adults 18-25 years, and older women 45-55 years.

BD was measured in three sites using the DEXA (Hologic QDR-1000W). Relationships between BD and age (years), weight (kg), height (cm), dietary calcium (mg/day) and activity were assessed. Dietary calcium was assessed using a milk scale chart (MSC). Walking and sporting activity were assessed in hours/week over the past year. Results for calcium intake and sporting activity are summarised in the following table.

	Calcium intake from MSC (mg/day)		
Sport hours per week	Adolescents (N=235)	Young adults (N=87)	Older women (N=153)
0-1	598±514 (N=21)	607±427 (N=31)	525±454 (N=92)
2-3	667±437 (N=69)	490±346 (N=31)	381±222 (N=33)
4-7	731±520 (N=85)	428±568 (N=14)	351±161 (N=18)
>7	659±457 (N=60)	419±290 (N=11)	351±161 (N=10)P

There was a trend for reduced calcium intake with increased sporting activity in older women and young adults which was not seen in adolescents.

In multiple regression analysis for adolescents (N=228) significant covariates (Beta ± SEM) for the hip were: age, 0.21 ± 0.07 ; age^2, -0.006 ± 0.002; weight, 1.5 x 10^{-3} ± 6.2 x 10^{-4} and sport hours/week, 0.03 ± 0.01 (R^2=0.33, F<0.0001). Significant covariates for the spine were: age, 0.42 ± 0.091 and age^2, -0.01 ± 0.003 (R^2=0.22, F<0.0001).

In young adults (N=84) the significant covariate for the hip was height, 1.2 x 10^{-2} ± 5.3 x 10^{-3} (R^2=0.05, F<0.05) and for the spine, weight, 6.9 x 10^{-3} ± 2.8 x 10^{-3},(R^2=0.07, F<0.05). No significant covariates were found for older women (N=150).

There was no relationship between calcium intake determined by FFQ and BD. The interaction of activity and dietary intake in older women and young adults should be assessed in future studies.

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